

FIG. 5A

```
public class StringVariableModel extends VariableModel
/**
 * A template method which calls subclass methods (which should
 * call super.doValidate()), then employs the Strategy pattern by calling
 * all of the set of CustomValidators. The first error causes the function
 * to return. If there is no error, then all listeners will be notified
 * of the new value.
 */
public boolean validate(Object value, boolean displayErrors)
{
    String errorString;
    String strVal = (value == null) ? new String("") : value.toString();
    VariableChangedEvent vce = new VariableChangedEvent(this, strVal);

    errorString = doValidate(value, vce);
    if ((errorString == null) || (errorString.compareTo("") == 0))
    {
        Iterator it = validators.iterator();
        while (it.hasNext())
        {
            errorString = ((CustomValidator)it.next()).validate(value);
            if ((errorString != null) && (errorString.compareTo("") != 0))
                break;
        }
    }
    if ((errorString != null) && (errorString.compareTo("") != 0))
    {
        // put up a dialog or message box containing the error message.
        if (displayErrors)
        {
            JOptionPane.showMessageDialog(null, errorString, getLabelText(),
                JOptionPane.ERROR_MESSAGE);
        }
        return false;
    }
    processValueChanged(vce);
    return true;
}
```

FIG. 5A

FIG. 5B

```
public void addValidator(CustomValidator cv)
{
    validators.add(cv);
}

public void removeValidator(CustomValidator cv)
{
    validators.remove(cv);
}
```

FIG. 5B